Faces of Genesis

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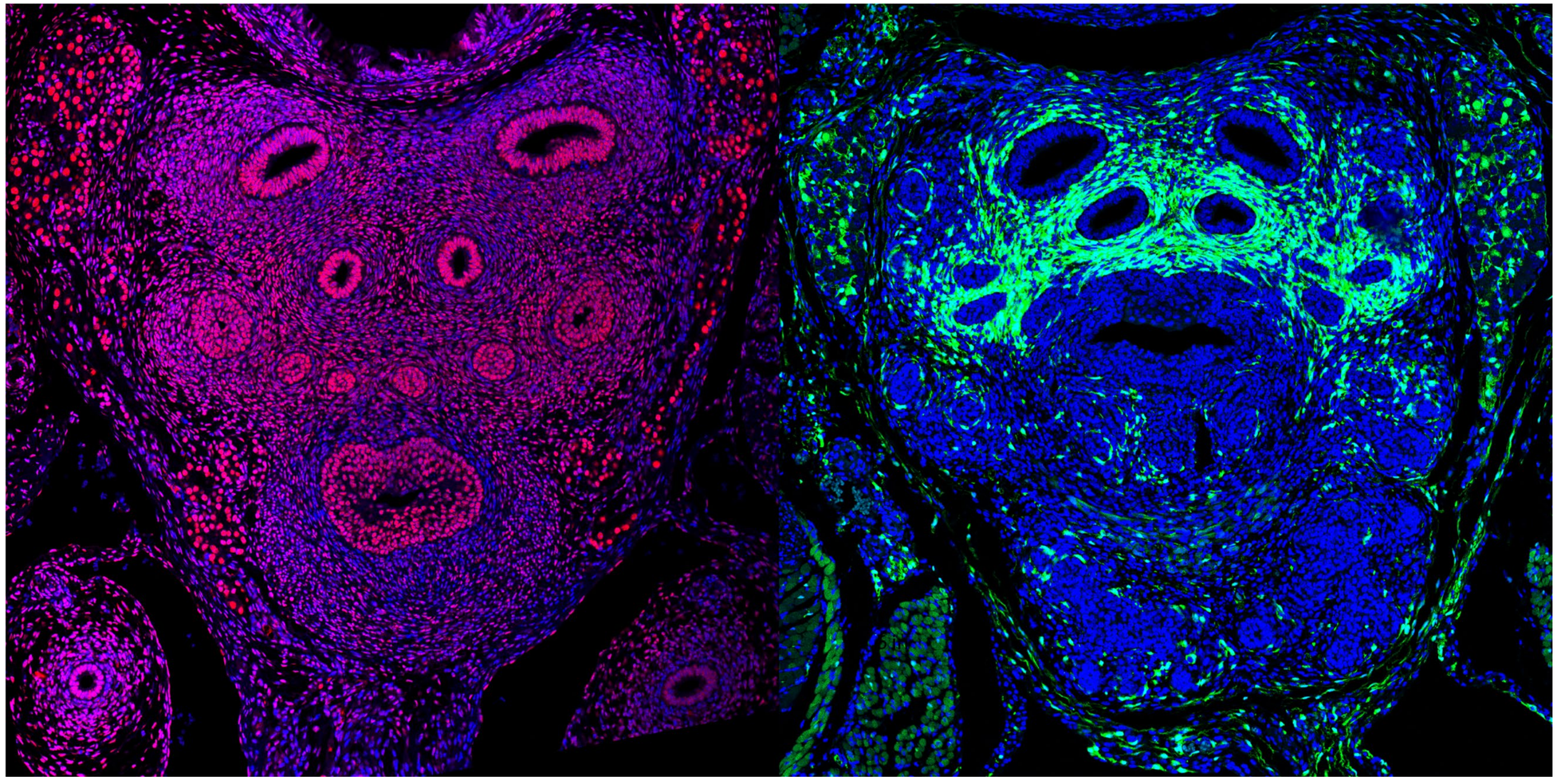

Embryogenesis is the result of a carefully orchestrated sequence of molecular events that control how cells divide and differentiate. This complex process of forming functional organs requires the expression of essential proteins, often with opposing functions, in very distinct patterns. This image represents thin sections of the urogenital tract of a mouse embryo, 18 days after conception and 1 day before birth. Red and green mark expression of specific proteins essential for tissue development. The left panel marks Proliferating Cell Nuclear Antigen protein in red, a molecule that promotes DNA replication in actively dividing cells, a representation of the massive expansion at this prenatal stage. The right panel marks TBX18 protein in green, a transcription factor that inhibits gene expression thus regulating organ development, a masked repressor confined to the upper half of the tract. Studying these proteins is essential for understanding how life begins at the molecular level. My graduate research elucidates the intimate coordination between such proteins at the early stages of life and how they impact future organ development and function.